Upgrade kit OPTIMUS rel. 2.3

4512 104 39882

FILING INSTRUCTIONS

File this documentation in binder: OPTIMUS

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Philips Medical Systems
Development and Manufacturing Centre

SERVICE MANUAL
742
UNIT

Upgrade kit OPTIMUS release 2.3

4512 104 39882

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SERVICE MANUAL - UNIT

Upgrade kit OPTIMUS rel. 2.3

Author: A. Duve

Type No: 4512 104 39882

In case there are any questions concerning this manual,
please send this LOPAD via fax to 49/(0)40/5078 2481

File:UK OPTIMUS rel 2.3_980

List of pages and drawings (LOPAD) **Manual Order No: 4512 984 08411**

0.5	(98.0)	223 mm	(Rosa Karton)
1	(98.0)		
2	(98.0)		
3...15	(98.0)		
Z-1	(96.0)	A4 [1])	
Z-2	(96.0)	A4 [1])	
Z-3	(96.0)	A4 [1])	
5Z-1.1	(98.0)	A4 [2])	
5Z-1.2	(98.0)	A4 [2])	
5Z-2.1	(98.0)	A4 [2])	
5Z-2.2	(98.0)	A4 [2])	

[1]) Upgrade OPTIMUS rel. 2

[2]) OPTIMUS RAD

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TEXT

	Contents	3
1.	**Establishing of the system CAN plug adapter**	**5**
2.	**Saving of the CMOS (CU Complete), APR and error log**	**5**
3.	**Stator cable screen***	**6**
3.1.	Cable routing modification*	6
3.2.	Cable modification in the generator	7
3.3.	Generator side – – > (stator cable to the tube(s))*	7
3.4.	Tube side*	8
4.	**Removal of suppressor diodes from internal generator CAN bus***	**8**
3.1.	If option(s) adapter decade cable WA / 1WA+2WA are installed*	9
5.	**Exchange of the CAN termination plug***	**10**
5.1.	If one WA unit is installed*	10
5.2.	If 1WA and 2WA units are installed*	10
5.3.	If no WA unit is installed = Bucky Controller*	10
5.4.	If any WA unit in combination with a Bucky Controller is installed*	10
6.	**Establishing of 33pF and 1nF capacitors***	**11**
7.	**PCB mA_control EZ119 modification**	**11**
8.	**High Speed Rotor Control modification**	**12**
9.	**Establishing of wired choke***	**13**
10.	**Exchange of the High Speed Rotor Control PROM**	**14**
11.	**Exchange of the kV-control PROM***	**14**
12.	**Exchange of the desk PROM***	**15**
13.	**Exchange of the CU PROMs**	**15**
14.	**Functional tests**	**15**
15.	**Documentation**	**15**

*** Note**

*If the generator has been modified with the interims kit **4512 104 39881** Modification kit OPTIMUS release 2.2 parts of this modification are already done and do not have to be repeated.*
*These chapters are marked with ******

DRAWINGS

C 300 PCB modification Desk CPU	Z–1
EZ 119 PCB modification mA control	Z–2
EZ 130 PCB modification kV control	Z–3
PCB programming central rack EZ	5Z–1.1
PCB programming central rack EZ	5Z–1.2
PCB programming OPTIMUS	5Z–2.1
PCB programming OPTIMUS	5Z–2.2

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This modification kit contains of:

- 1	set of PROMS CU Release 2.3	4512 114 208**23** = 4512 113 18027 / 18037
- 1	PROM kV-control	4512 113 20121
- 1	PROM control desk	4512 113 20523
- 1	PROM rotor control high speed	4512 113 22312
- 1	system CAN plug adapter EZX43-1	4512 104 90531
- 1	generator CAN termination plug EZX45	4512 104 39901
- 1	wire for high speed rotor control PCB EY100 (version	4512 108 08701/2)
- 1	suspension with springs for stator cable screen	4512 104 37822
- 1	choke, wired for high speed rotor control units	
- 1	bracket (self adhesive) for choke	
- 1	capacitor 33 nF for PCB mA control	2022 333 00024
- 1	capacitor 1 nF for PCB CU control desk	2012 573 00015
- 2	capacitors 33 pF for kV/mA control	2222 682 10339
-	cable ties	
-	this documentation	

Tools required:

- 3 + 4 mm Allan keys
- 10 mm open-end wrench
- low watt soldering iron with **fine tip**
- standard tools
- service PC with hardkey
- flash light
- PLCC extraction tool AMP 822154-1 2422 487 89772

Prerequisite:

If the generator has not been delivered with Release 2.2 (4512 114 20822, see STAMMKARTE at frontal kV_power unit cover), one of the following upgrades to Release 2.2 must have been carried out:

- **4512 104 38561**	Release 0.2 / 0.3 / 1.1	-> Release 2.2	including TDC
- **4512 104 38611**	Release 0.2 / 0.3 / 1.1	-> Release 2.2	(USA and AUS only)
- **4512 104 38401**	Release 0.2 / 0.3 / 1.1	-> Release 2.2	**FCO 00 135 002**
- **4512 104 38801**	Release 2.1	-> Release 2.2	**FCO 00 135 003**

*** Note**
*If the generator has been modified with the interims kit **4512 104 39881** Modification kit OPTIMUS release 2.2 parts of this modification are already done and do not have to be repeated.*
*These chapters are marked with ******

Modification:

Attention
When handling PCBs, take all the necessary Electro Static Discharge (ESD) precautions.

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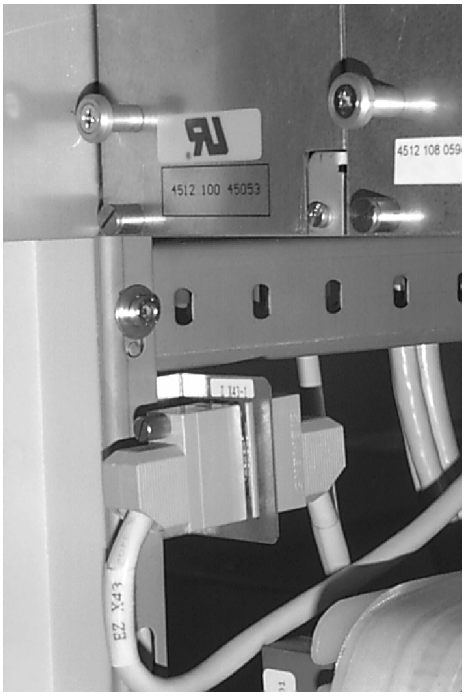
1. Establishing of the system CAN plug adapter

This modification is **only** required at generators which are connected to a Bucky Controller system via **CAN** bus **EZX43**.

During loading of big data sets from or to the generator (e.g. CU Complete, tube data and APR) there should be no communication with the Bucky Controller to ensure a correct and complete loading.

To undo the CAN connection in a more convenient way without removing the generator from the wall establish the adapter EZX43 <--> EZX43-1:

- Remove the system CAN cable from EZX43.
- Fix **EZX43-1** according to the picture at the left frontal side of the generator rack.
- Establish the system CAN cable to EZX43-1.



Note
Whenever big data sets have to be loaded from or to the generator, open the system CAN connection at EZX43-1 before the generator is turned on.
Turn on the generator and wait at least 2 minutes before starting a loading procedure.

2. Saving of the CMOS (CU Complete), APR and error log

Note
Whenever using XRGSCOPE, start from DOS if possible. Using WIN95 might cause some unexpected problems (WIN 3.x also) depending on the number of multitasking background programs.

An installation disk is attached to the upgrade kit including the last version of XRG Scope. APRMAN is as a self extracting file on the disk, load it to the PC hard disk.

- Download the actual CMOS (Accept – Backup – **CU Complete**, filename e.g. CU95xxxx. TDL = serial number of generator) to the backup disc in the documentation binder.
- Save **APR** with **APRMAN**ager.
- Save the **error log index** (Faultfind – Logging Table – Error Log – Error Log Index – <F3>, filename e.g. ER95xxxx. TDL).

We always need feedback from the field. Please send the file to :

Carsten Mais, DMC Hamburg, Service Innovation
BBS (node 320/0) or
e-mail Carsten.mais@de.ms.philips.com

- Delete the error log index (Faultfind – Logging Table – Error Log – Error Log Clear – <OK>)

  If possible, send an error log index next time you visit the site. It helps us monitoring the improvement of the Release 2.3 upgrade and what else is going on in the generators.

- Switch off the generator

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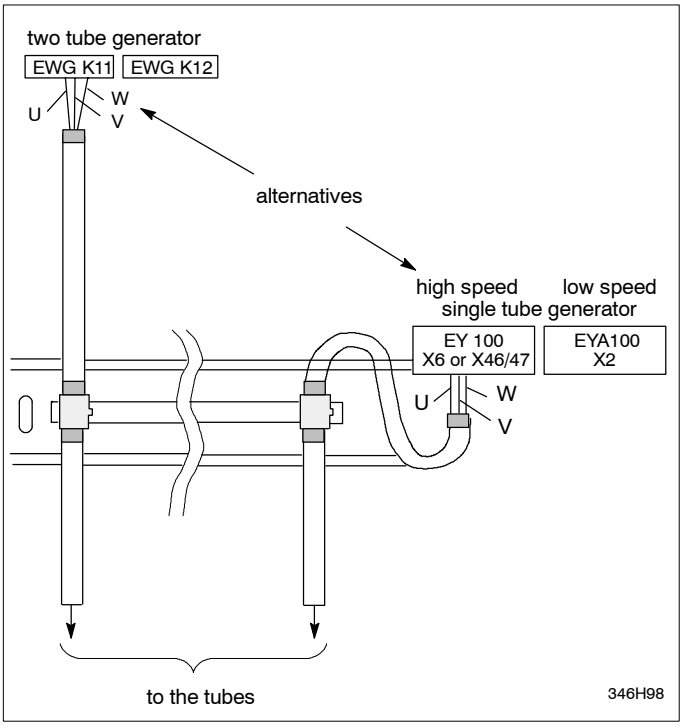
3. Stator cable screen*

To reduce the noise from the rotor control units down to an absolute minimum and to be less sensitive against tube arcing a 360° cable screen mounting has to be achieved at both ends of the stator cable. (Only exception: see 3.2.)

3.1. Cable routing modification*

The routing of cable overlengths can be optimized.

The stator cable must be shortened to its required length, which means: If it leaves the wall and goes straight to the generator. If the stator cables has to be shortened, it must be mounted according to sketch.



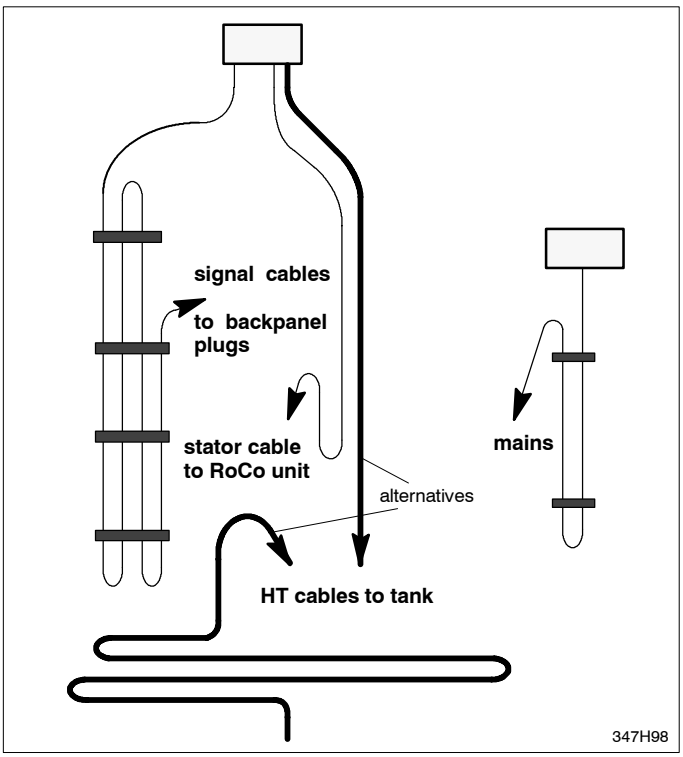
If all overlengths are in the wall junction box, they should be routed up and down or left and right and tied up in a closed loop according to sketch.

Try to separate
- signal
- mains and
- HT + stator cables

in the wall junction box...

The minimum bending radius must be 5 cm / 2 inch for 16.5 and 20 mm ∅ HT cables
and
7cm / 3 inch for 23 mm ∅ HT tables.

Always avoid open loops.



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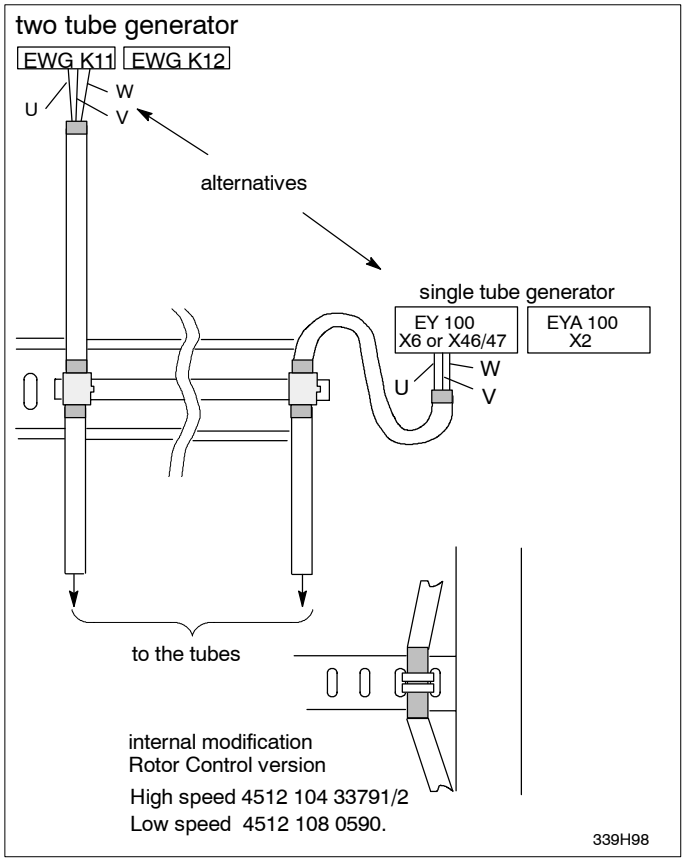
3.2. Cable modification in the generator

Only, if high speed rotor control units 4512 104 33791 / 2 or low speed rotor control units 4512 108 0590. are present in combination with tube extension WG. If not, proceed to 3.3.

The routing of the internal stator cable connection from rotor control EY/EYA to tube extension WG is at the right hand rear side of the rack. It is fixed with a cable tie at a security rail on the right hand outside.

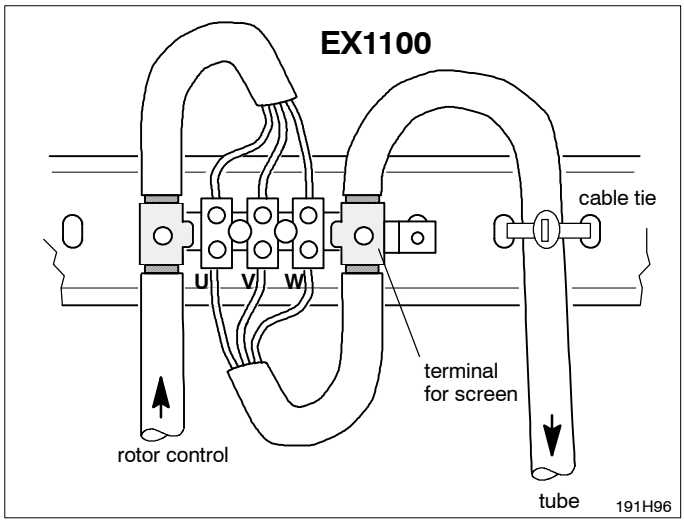
- Discard the cable tie and remove 4 cm / 1.5 inch of the cable insulation to get the open screen at the security rail.
- Fix the cable with two cable ties to obtain a proper contact of the screen to the rail.



3.3 Generator side --> stator cable to the tube(s)*

If the stator cable is already connected as shown on sketch, proceed to 3.4.

- Mount the screen fixing carrier at the cable security rail (see also sketch above).
- Cut off and discard the red screen / ground wire of the stator cable to the tube(s).
- Remove 2.5 cm / 1 inch from the stator cable insulation at the point where it passes the carrier.
- Secure the screen(s) with the screening clamp at the carrier according to sketch above.
- Secure the cable with a cable tie.



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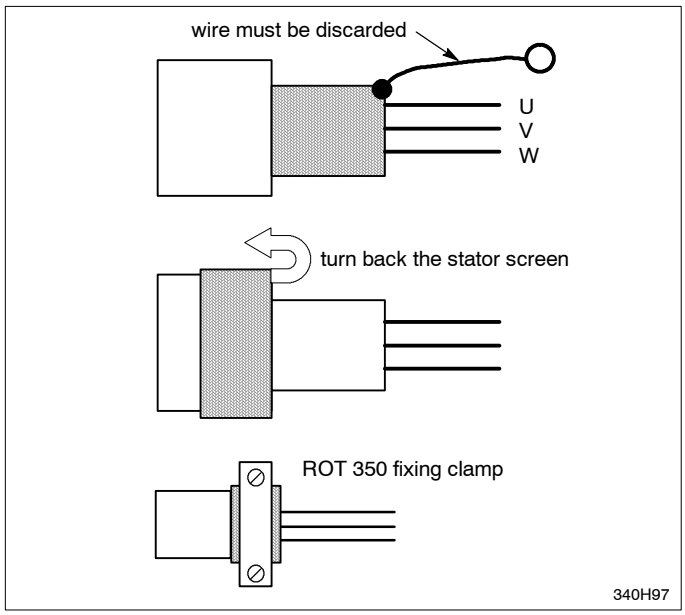
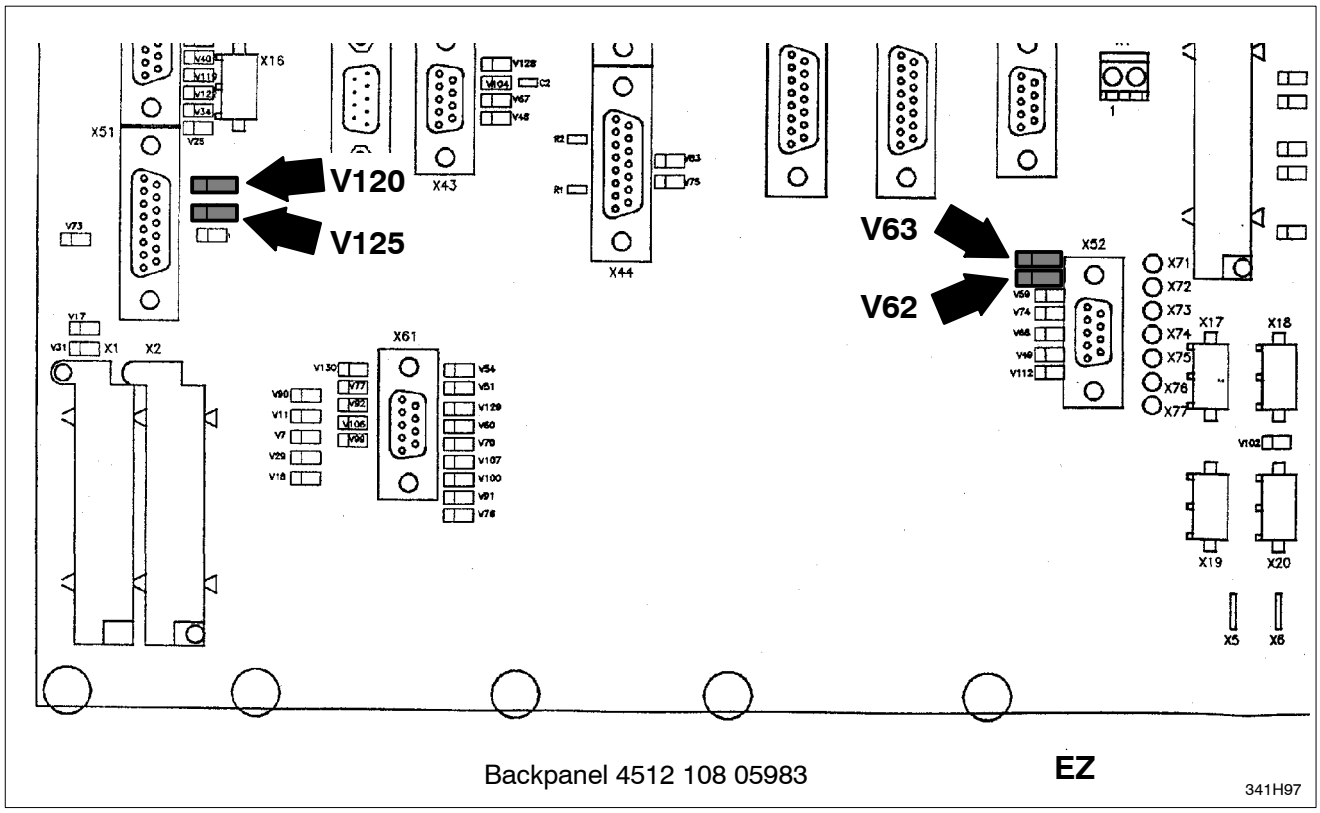
3.4 Tube side*

- Remove stator cable clamp(s) and disconnect the stator lines from the stator connection.
- Cut off and discard the red screen / ground wire.
- Remove the stator cable insulation / shrunk insulation to get 1 cm / 1/2 inch of open screen.
- Turn back the stator cable screen.
- Scratch off the color on the inside of the cable clamp(s) to get the best ground contact via the tube housing – clamp – cable screen.
- Secure the stator cable(s) at the screen with the clamp and connect the stator phase lines.



4. Removal of suppressor diodes from internal generator CAN bus*

The following list of suppressor diodes parallel to the CAN_H and/or CAN_L signals have to be removed:
EZ backpanel version 4512 108 0598**3**



V 62 V 63 V 120 V 125

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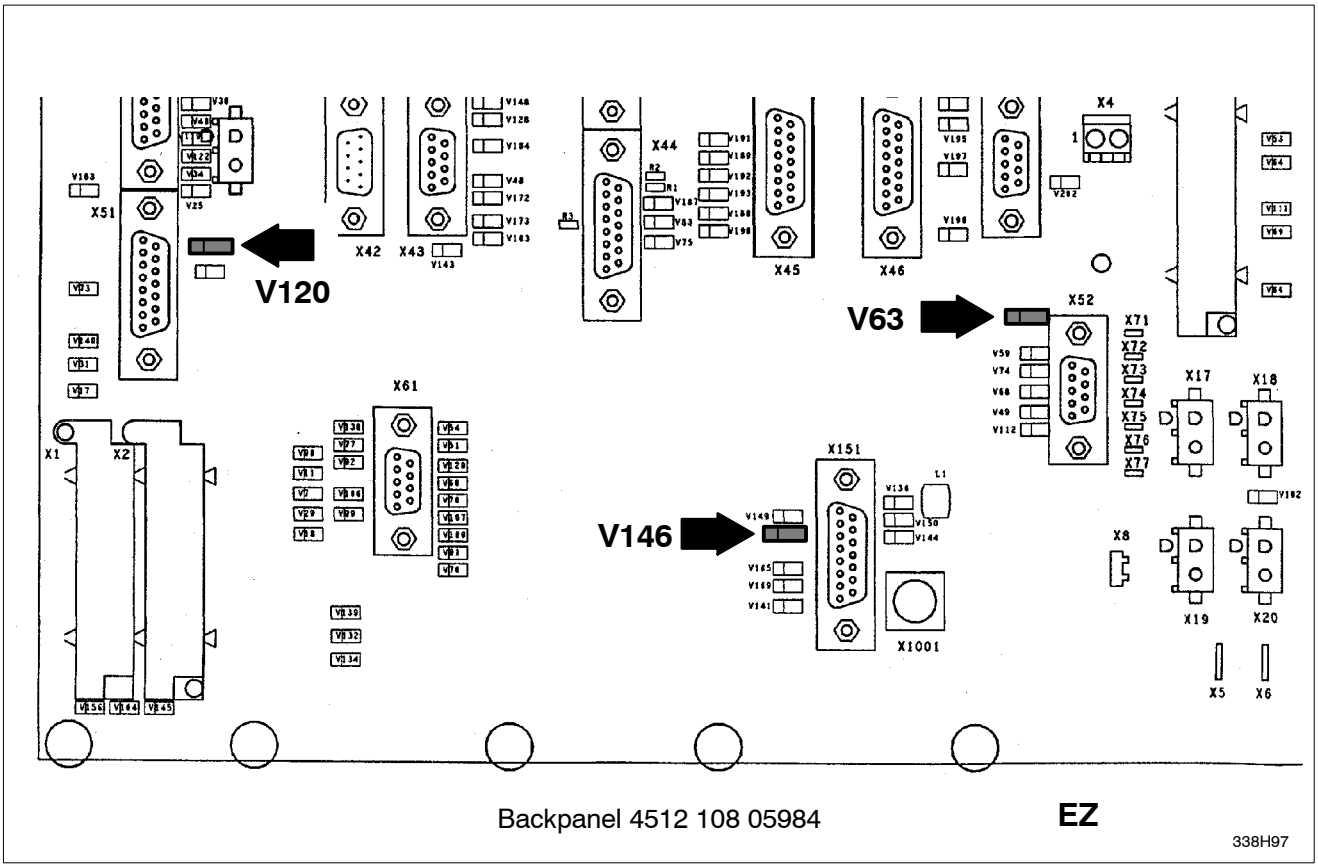
EZ backpanel version 4512 108 0598**4**



V 63 V 120 V 146

4.1. If option(s) adapter decade cable WA / 1WA+2WA are installed*

WA or 1WA +2WA (RAD adapter for 4 aux. units) backpanel versions 4512 108 0806**1**/**2** (see sketch page 10).

Remove and discard diodes WA V55 and V56 (see sketch page 10).

Keep the soldering iron on.

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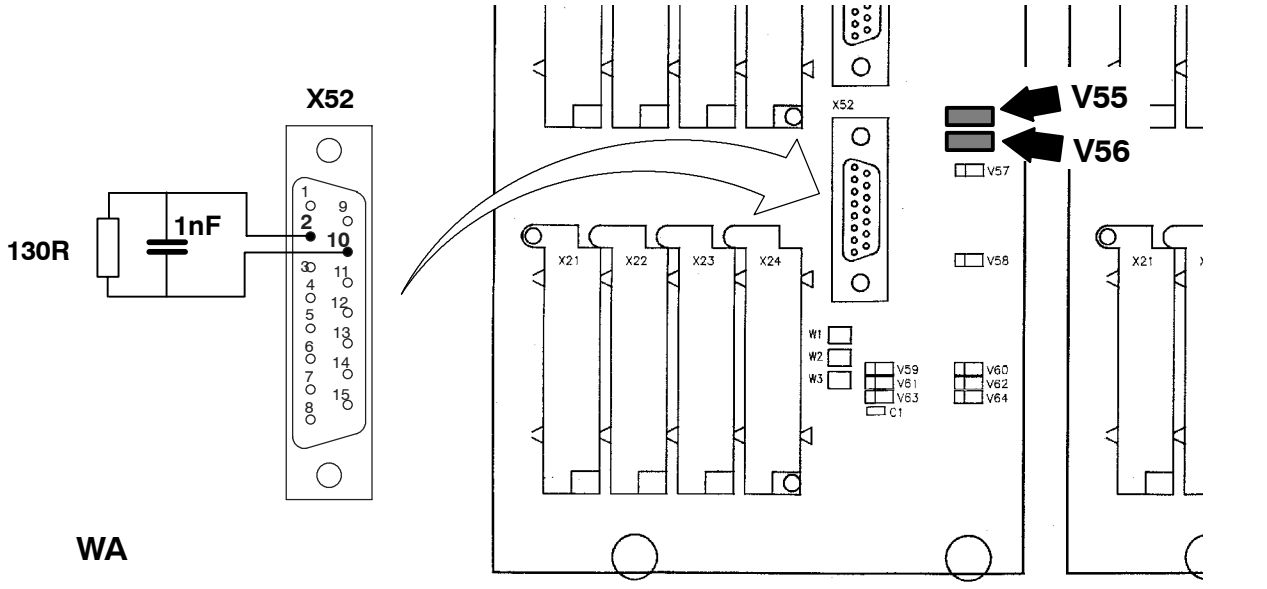
5. Exchange of the CAN termination plug*

5.1. If one WA unit is installed *

- Remove and discard CAN termination plug **EZ X52**.
- Establish the 15-pin **male** Sub-D termination plug with the RC circuit at **WA X52**.



Backpanel WA 4512 108 08061/2

335H97

V 55 V 56

5.2. If 1WA and 2WA units are installed*

- Remove and discard CAN termination plug **EZ X52**.
- Establish the 15-pin **male** Sub-D termination plug with the RC circuit at the free **1/2WA X52** (see sketch above).

5.3. If no WA unit is installed = Bucky Controller*

Only the **EZ** backpanel diodes have to be removed.

- Remove and discard CAN termination plug **EZ X52**.
- Establish the 15-pin **male** Sub-D termination plug with the RC circuit at **EZ X45**.

5.4. If any WA unit in combination with a Bucky Controller is installed*

- Remove and discard CAN termination plug **EZ X52**.
- Establish the 15-pin **male** Sub-D termination plug with the RC circuit at the free **1/2WA X52** (see sketch above).

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6. Establishing of 33pF and 1nF capacitors*

It might be possible that there is no print or any other indication on the capacitors. It is easy to identifythe different types: there are two 33pF and one 1nF. According to drawings Z-1, Z-2 and Z-3 the 33pF and 1nF capacitors should already be in the generators, finally with the upgrade to release 2.2. If not, put the capacitors in.
The 1nF capacitor is not required on PCB desk CU version 4512 108 08245.

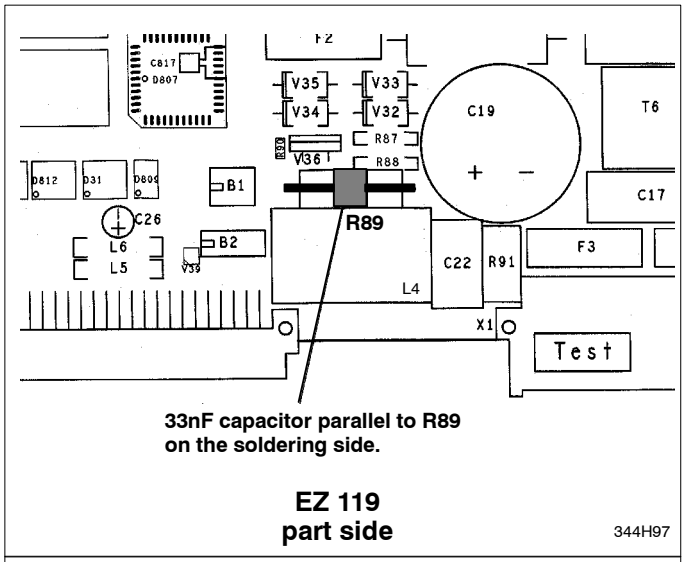
Keep the desk open and leave PCBs EZ130 and EZ119 outside for the next steps.

Keep the soldering iron on.

7. PCB mA_control EZ119 modification

- To prevent from malfunctions during switch on which may blow fuse F3 on mA_control, a capacitor has to be soldered to the PCB.
- The capacitor will be connected parallel to R89. To get it as close as possible to the PCB surface, two soldering points of the choke L4 have to be cut down as short as possible.
- Solder the capacitor to the points given on sketches.
- Now EZ119 can be put back to the generator.

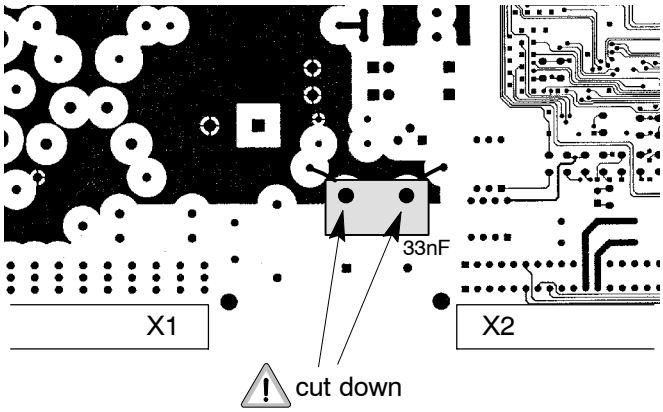
Keep the soldering iron on.



33nF capacitor parallel to R89 on the soldering side.

EZ 119 part side

344H97



EZ 119 soldering side

345H97

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8. High Speed Rotor Control modification

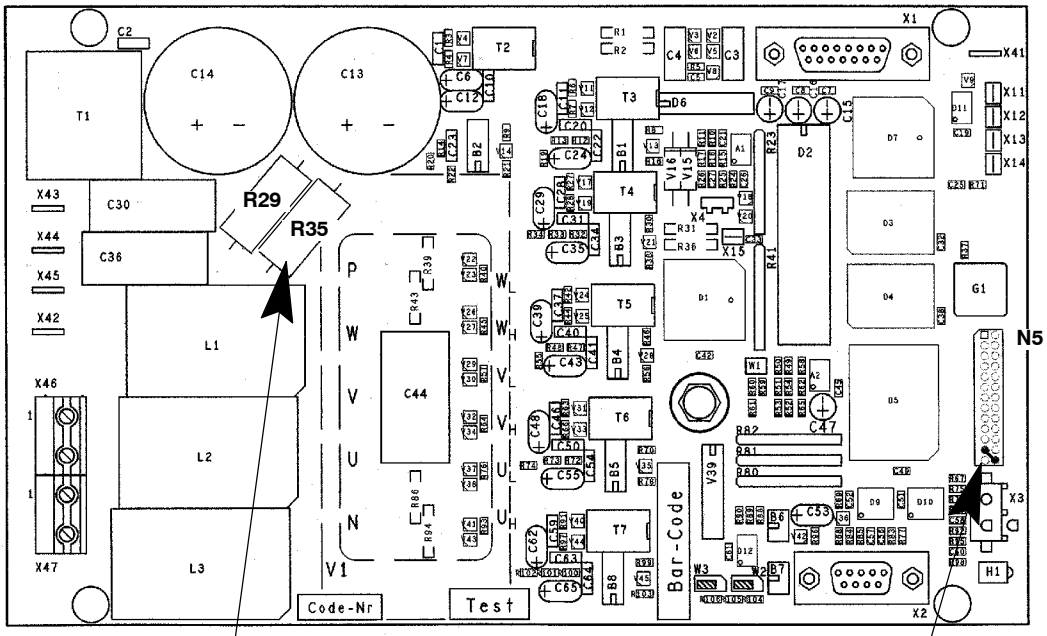
Modification of the PCB High Speed Rotor Control EY 100

The processor on the rotor control has a debug port. One of the signals is not connected to a pull up resistor. The floating signal leads to the error combination 00XI + 00M3. It happens only once during turn on, not during normal operation.

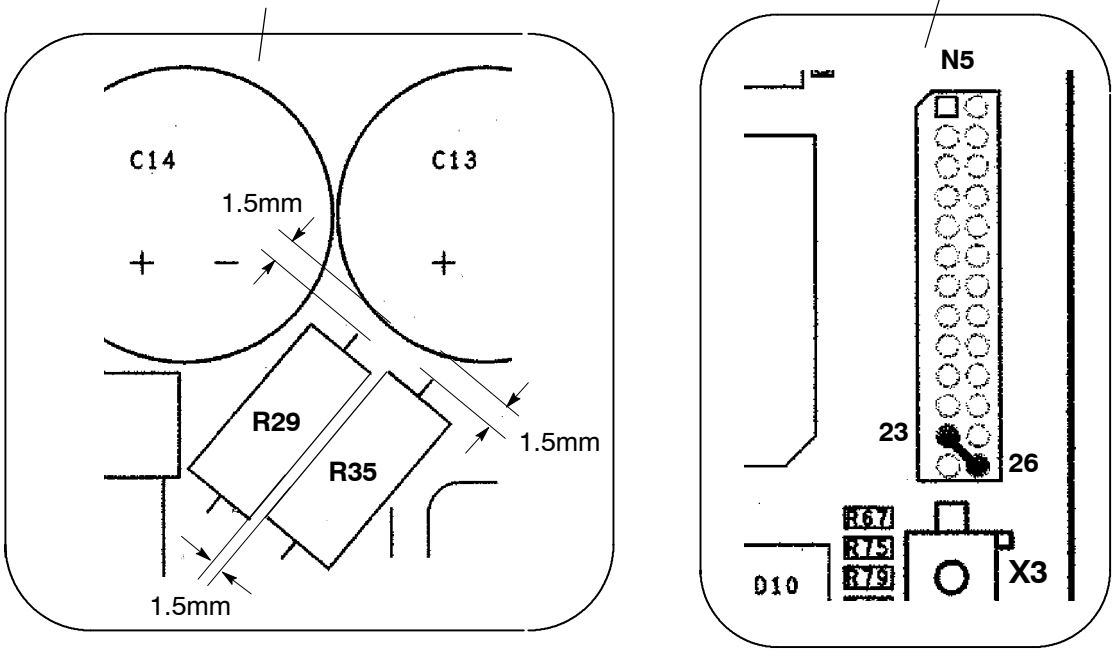
- solder a link between N5:23 and N5:26 of the EY 100 PCB. see sketches.

- Remove plug X3 during the soldering process, which gives an easier access to the points.

4512 108 08701/2



Check that the connnecting wires of resistors R29 / R35 have a distance of at least **1.5 mm** to the capacitors C13 and C14. Also between the resistors itself a gap of **1.5 mm** is necessary, see sketch.
When the resistors come in contact to the capacitors or have mechanically contact to each other this can lead to a shortcircuit and defect of the rotor control.



Keep the rotor control unit open for for a next step, the soldering iron is not needed anymore.

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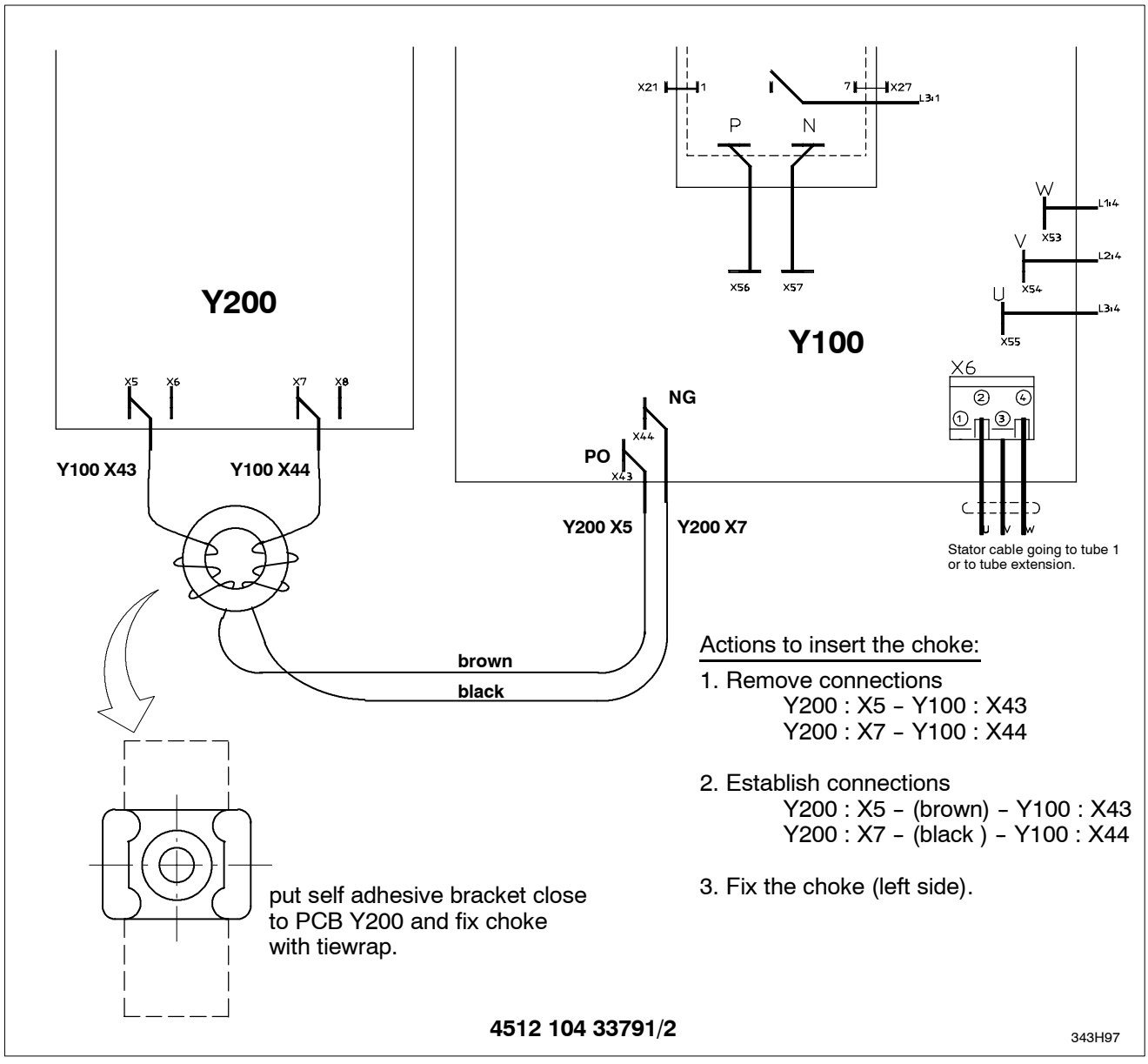
9. Establishing of wired choke*

In case a high speed rotor control is installed:

- Discard wires EY200 X5/6 EY100 X43
  EY200 X7/8 EY100 X44
- Establish the above connections with the wires of the choke. Fix the choke according to sketch.

For units 4512 104 33791 / 2



Keep the rotor control unit open for a next step.

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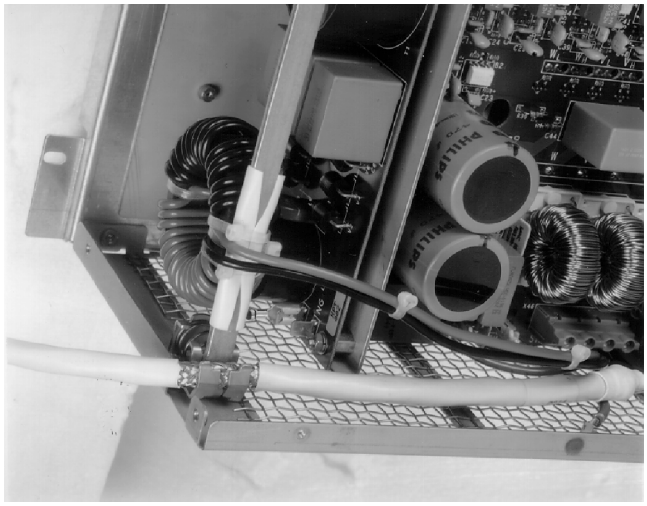
For units 4512 104 71401 / 2

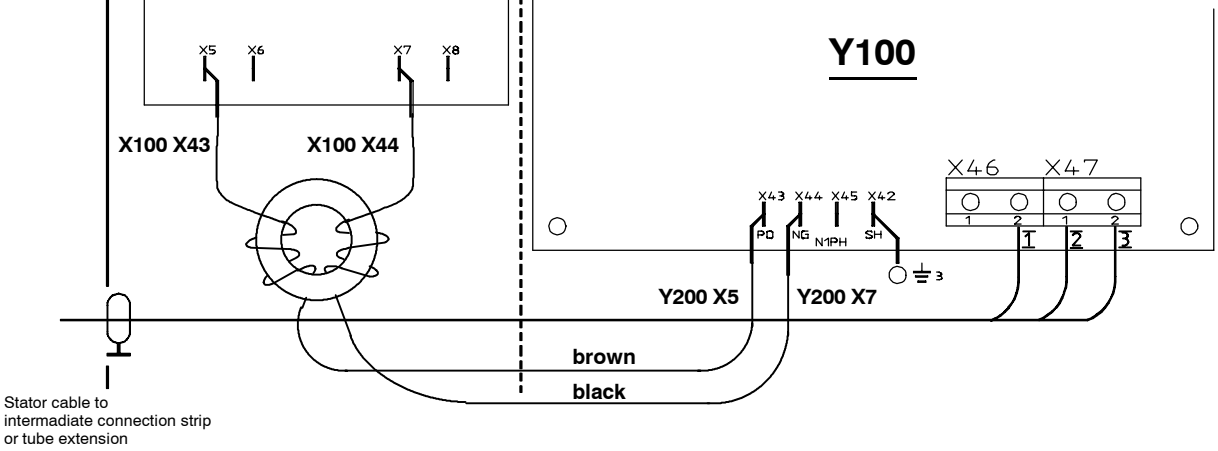
Actions to insert the coil:

1. Remove connections
   Y200 : X5 – Y100 : X43
   Y200 : X7 – Y100 : X44

2. Insert the coil
   Y200 : X5 – (brown) – Y100 : X43
   Y200 : X7 – (black) – Y100 : X44

fit the coil by using the isolation strip and tiewraps as shown in the appended drawing.





4512 104 71401/2 342H97

- The easier way to get the choke in is by removing the rotor control rack.

!!! ATTENTION !!! Units 4512 104 71401 / 2 !!!

!!! Do NOT use X45 by mistake !!! One of the capacitors will explode immediately after switch on !!!

Keep the rotor control unit open for a next step.

10. Exchange of the High Speed Rotor Control PROM

- The RoCo PROM EY100 D2 has to be exchanged by the 4512 113 22312 labelled version attached.
- (PROM location see also pages 5Z–2.1).
- The unit can be closed now.

11. Exchange of the kV-control PROM*

- The kV_control PROM EZ130 D800 has to be exchanged by the **20121** labelled version attached. (PROM location see also pages 5Z–1.2).
- PCB can be reinserted now.

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12. Exchange of the desk PROM*

- The control-desk PROM C300 D2 has to be exchanged by the **20523** labelled version attached.
- (PROM location see also pages 5Z-2.2).
- The control desk can be closed now.

13. Exchange of the CU PROMs

- The CU PROM EZ139 **D4** LSB has to be exchanged by the **18027** labelled version attached.
- The CU PROM EZ139 **D5** MSB has to be exchanged by the **18037** labelled version attached.
- (PROM location see also pages 5Z-1.2).

14. Functional tests

- If the system CAN connection EZX43 has been taken out, reinsert it now to EZX43-1.
- Switch on the generator.

Note

- Since the desk control PROM version 20523 the control desk sets dots in the APR name fields during start up. Depending on the site configuration the ready time might be different.
- Does the generator come up as before the upgrade ?
- Check menu / APR settings, Film-Screen-Combination assignments.
  With Bucky systems via CAN: Does the control handle work as before and is the selection of the preferred APR from the control handle still the same ?
- Switch exposures, use all available techniques (AEC, AEC fixed current, TDC, kV-mAs, kV-mAs-s, kV-mA-s).

15. Documentation

- File this FCO instruction under Tab 8 SERVICE INFORMATION in the Service Manual binder.

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